

**REMARKS**

Attorney for Applicants has carefully reviewed the outstanding Office Action on the above-identified application. Applicants have amended the application, as set forth herein, and respectfully submit that the application, as amended, is in condition for allowance.

Applicants have amended claims 24, 32, 41, 42, 50, and 58, and added new claims 62-65 to further define Applicants' claimed invention. Further, Applicants have amended claims 33 and 40 to overcome the rejections raised in the Office Action. Claims 29, 30, 38, and 39 are cancelled.

Applicants have amended claim 24 to include the word "comprising" in the preamble of said claim. Additionally, the limitation "positioned at facing relation" was removed from the first element of the claim, so that the first element recites "a pair of electrodes having a space therebetween." Support for this amendment is found throughout the specification, and Applicants submit that no new matter has been added.

Applicants have amended 32 to remove the limitation "a high temperature dielectric." Claim 32, as amended, now recites that the dielectric is able to withstand high temperatures. Support for this amendment is found on page 8 of the specification at lines 20-21 ("the dielectric is preferably formed of a material that can withstand high temperatures"). No new matter is believed to have been added with this amendment.

Applicants have amended claim 33 to correct a minor typographical error (the semicolon appearing after the word "comprising" of the preamble was replaced with a colon), and to overcome the objection raised in the Office Action with respect to the preamble of said claim. Specifically, the Office Action indicated that the preamble "a cathode" is not consistent with the references to an "apparatus" appearing in dependent claims 34-41. Applicant has accordingly replaced the preamble "a cathode" of claim 33 with the preamble "an apparatus" to provide consistency with dependent claims 34-41. Therefore, the objection with regard to claim 33 is believed to be overcome.

Applicants have also amended claim 33 to overcome the rejection of the Office Action under 35 U.S.C. § 112, second paragraph. Specifically, the term "the electrodes" was replaced with "the electrode" to provide antecedent basis. With this amendment, the requirements of 35 U.S.C. § 112, second paragraph are met.

Applicants have amended claim 40 to overcome the rejections of the Office Action under 35 U.S.C. § 112, second paragraph. Specifically, claim 40 was amended to provide antecedent basis, and now recites a second perforated dielectric means placed over a second electrode. Accordingly, the requirements of 35 U.S.C. § 112, second paragraph are met.

Applicants have amended 41 to remove the limitation "a high temperature dielectric." Claim 41, as amended, now recites that the dielectric is able to withstand high temperatures. Support for this amendment is found on page 8 of the specification at lines 20-21 ("the dielectric

is preferably formed of a material that can withstand high temperatures"). No new matter is believed to have been added with this amendment.

Applicants have amended claim 42 to include the word "A" before the word "method" in the preamble of said claim. Additionally, the terms "opposing" and "facing" were removed from the first element of the claim, so that the first element recites "positioning electrodes in a relation with a space therebetween." Support for this amendment is found throughout the specification, and Applicants submit that no new matter has been added.

Applicants have amended claim 50 to replace the element "positioning electrodes in a facing relation" with the element "providing a pair of electrodes." Additionally, the term "density" was removed from said claim. Applicants submit that support for these amendments is found throughout the specification, and that no new matter has been added.

Applicants have amended claim 58 to remove the terms "opposing" and "facing" from the first element of said claim. Claim 58, as amended, now recites "positioning electrodes in a relation with a space therebetween." Support for this amendment is found throughout the specification, and Applicants submit that no new matter has been added.

Applicant has added claims 62-65. Claims 62-65 depend from claims 24, 42, 50, and 58, respectively, and provide that the electrodes are positioned in a facing relation. No new matter is believed to be introduced by these claims.

The Office Action rejected claims 24-61 under the doctrine of obviousness-type double patenting over U.S. Patent Nos. 5,872,426 and 6,005,349 to Kunhardt, et al., assigned to the same assignee as the within application. Applicant submits herewith terminal disclaimers to overcome this rejection. Please charge the fee of \$110.00 for the Terminal Disclaimers to Deposit Account No. 06-2143.

Applicants respectfully traverse the rejection of the Office Action of Applicants' pending claims as being obvious over U.S. Patent No. 5,387,842 to Roth, et al. Reconsideration is respectfully requested.

Applicants' claimed invention relates to a method and apparatus for suppression of the glow-to-arc transition in glow discharges. The invention comprises a perforated dielectric positioned over an electrode for stabilizing glow plasma discharges by suppressing the glow-to-arc transition commonly present in such discharges. The dielectric can be held in place by a collar surrounding the plate and attached to an electrode. Each of the perforations of the dielectric act as a separate, active current-limiting microchannel that prevents the overall current density from increasing above the threshold for the glow-to-arc transition. A single perforated dielectric can be positioned over a single electrode (e.g., a cathode) for suppressing glow-to-arc transition in DC-induced glow discharges. Optionally, another perforated dielectric plate can be positioned over an opposite electrode (e.g., an anode) for suppressing glow-to-arc transition in AC- or RF-induced glow discharges.

Roth, et al. relates to a device for creating a steady-state, glow discharge plasma in a volume between a pair of parallel, insulated metal plate electrodes spaced 5 cm apart and energized with RF at an RMS potential of 1 to 5 kilovolts at 1 to 100 kilohertz. A dielectric is provided around each of the electrodes, and the electrodes are positioned in a noble gas atmosphere (e.g., helium, neon, argon, etc.). The electrodes are preferably plates that are water cooled and coated with a dielectric insulation. See col. 1 at lines 67-68.

Applicants respectfully submit that Roth, et al. fails to teach or suggest each element of Applicants' claimed invention. Roth, et al. fails to teach or suggest providing a **perforated dielectric** in proximity to an electrode, as recited in Applicants' pending claims 24-49 and 58-61. Further, Roth, et al. is devoid of any teaching or suggestion to provide a **dielectric having a plurality of current limiting micro-channel apertures therethrough**, as set forth in Applicants' pending claims 50-57.


Applicants respectfully submit that the Office Action incorrectly construes element 14 of FIG. 1 of Roth, et al. as teaching a perforated dielectric, due to the appearance of element 14 in broken lines. Rather, Applicants respectfully submit that the broken lines are intended to show element 14 in phantom (a common engineering drawing notation for indicating that an object exists in reality, but is not visible in a current drawing view), and not that element 14 is perforated. Indeed, the entire specification of Roth, et al. fails to indicate anywhere that the element 14 is perforated. Rather, element 14 is only described as being a high dielectric insulation. See, e.g., col. 1 at lines 67-68 ("Preferably, the plates are water cooled and coated with a dielectric insulation."); col. 2 at lines 37-39 ("The integral metallic units comprising plates

10 and tubing 11 are covered with a high dielectric insulation material 14.") Thus, as can readily be appreciated from a careful review of the entire specification of Roth, et al., this reference is devoid of any teaching, suggestion, or motivation to provide a perforated dielectric in proximity to an electrode, as taught by Applicants. Accordingly, Applicants respectfully traverse the rejection of the Office Action of Applicants pending claims over Roth, et al. Allowance of Applicants' pending claims is therefore requested.

All issues raised in the Office Action are believed to be addressed. Claims 24, 32, 40, 41, 50, and 58 were amended, and new claims 62-65 are presented. Claims 29, 30, 38, and 39 are cancelled. Claims 24-28, 31-37, and 40-65 are pending in this application. No new matter is believed to have been added. Re-examination is requested and favorable action solicited.

Dated: 3/21/03

Respectfully submitted,



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